area doesn't correlate with angiographic grade and its continued clinical use should be questioned.

979-88 Echocardiographic Findings During Percutaneous Balloon Mitral Commissurotomy Using the Stepwise Technique

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There is a lack of consensus about the interest of the stepwise dilatation technique (SDT) using the Inoue balloon under transthoracic echo (TTE) guidance. We, therefore, evaluated SDT in 93 patients (pts). The mitral valve was pliable in 27 and fibrotic or calcified in 66. Balloon size (BS) was chosen according to the body height ; B was first inflated 4 mm below the max diameter and increased thereafter in stages of 1 mm each. After each inflation, commissural splitting (CS) and mitral regurgitation (MR) were looked for and the mitral valve area (MVA) was determined by planimetry. The criteria for stopping the procedure were CS with MVA > 1.5 cm^2 and/or significant MR. TTE was feasible in 88 pts (95 %) in whom CS occured in 93 % of cases. There was no difference between the final MVA during (1.77 ± 022 cm^2) and 24 hrs after (1.84 ± 0.23, r = 0.84) the procedure. Significant MR occurred in 5 pts : one at the first inflation, one at the max inflation and 3 at intermediate stages. In all, echo guidance altered the course of the procedure in 38 pts (43 %) : in 31, the dilatation was stopped before the max BS, because of CS (n = 26) or significant MR (n = 5) ; in 7 pts, the B was oversized due to a lack of CS. Finally, SDT resulted in progressive dilatation in pts with a pliable valve (gr. 1) while it was mostly efficient at max inflation in other pts (gr. 2).

Conclusion: 1) TTE allows accurate measurements during mitral dilatation. 2) It alters the course of the procedure in about 40 % of cases 3) It enables to observe how the balloon works : progressively or abruptly according to valve anatomy.

979-89 Relationship Between Ventilation and Carbon Dioxide Output Before and After Balloon Mitral Valvuloplasty

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In heart failure, for a given CO_2 output the ventilatory response (VE) is greater (↑ VE/CO_2 slope) than normal. This has been attributed to either skeletal muscle abnormalities or V/Q mismatch. This study was done to examine the early (improved hemodynamics) and late effects (conditioning) of balloon mitral valvuloplasty (BMV) on this relationship in patients with severe mitral stenosis. Accordingly, 10 subjects (age: 33 ± 6 yrs) underwent incremental exercise to exhaustion before BMV, 2 weeks after BMV and 4 months later. Data shown as mean ± SEM:

	Before	2 Wks	4 months
LA Pressure (mmHg)	21 ± 2	12 ± 2*	
Mean PA Pressure (mmHg)	35 ± 5	26 ± 3*	
Mitral Gradient (mmHg)	15.3 ± 2	4.8 ± 0.5*	
Mitral valve area (cm^2)			
Gorlin	0.86 ± 0.07	1.82 ± 0.13*	
Doppler	0.89 ± 0.04	1.75 ± 0.07*	1.76 ± 0.13*
VO_2Max(ml/Kg/min)	15.3 ± 1.6	17.2 ± 1.4*	19.9 ± 1.9*†
VE:VCO_2slope	42.6 ± 3	38.79 ± 2*	37.94 ± 2*

*p < 0.01 vs. before; †p < 0.05 vs. 2 weeks. LA = left atrium; PA = pulmonary artery.

Conclusions: The VE response to exercise is improved (decreased slope) early after BMV but no further improvement occurred later on, while VO_2 Max increased after 2 weeks and increased further at 4 months. The data suggest that early increases in exercise capacity following BMV may be due to improvements in hemodynamics while late improvements are likely to be due to physical conditioning.

979-90 Left Atrial Isolation Combined With Mitral Valve Surgery: Hemodynamic Evaluation During Cardiopulmonary Exercise Test

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Aim of the study was to evaluate the effects on cardiopulmonary response during effort of effective left atrial isolation (Cox technique) in patients (pts) with rheumatic mitral disease and long lasting atrial fibrillation (AF). We prospectively selected 11 pts, (age 58 ± 11 yrs) who had a mitral valve replacement (MVR) and left atrial insulation (Insulation Group) and 11 control pts (age 54 ± 5 yrs) with persistent AF submitted to MVR (AF Group) who were comparable for clinical characteristics. Six months after surgery, a cardiopulmonary maximal exercise test with Swan Ganz catheterisation was performed.

Main results	Isolation Group	AF group
Basal heart rate (b/min) (HR)	86 ± 7	91 ± 5
25% effort HR (b/min)	101 ± 11	129 ± 18*
50% effort HR (b/min)	112 ± 14	143 ± 18*
100% effort HR (b/min)	130 ± 17	179 ± 13*
DoubleProduct(mmHg/b/min)	21.4 ± 4.4	30.0 ± 2.3*
Cardiac Index (l/min/m2) at PE	5.7 ± 1.57	5.75 ± 0.6
VO2 max (ml/kg/min)	23.3 ± 7.25	22 ± 5.6
02 pulse max index (ml/kg/min/b)	0.17 ± 4.4	0.14 ± 0.046

Legend: PE = peak exercise, *p < 0.005, °p < 0.05

Pts with left atrial isolation compared to AF Group reached at peak exercise a comparable VO_2 max but with a lower myocardial oxygen consumption as expressed by the double product. In conclusion the sinus rhythm regained after MVR is not matched with an higher effort level or an higher VO_2 max but with a better exercise dynamics, determined by lower heart rates.

979-91 No Improvement in Exercise Performance After the Treatment of A Pure Mitral Stenosis

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Patients with mitral stenosis have limited exercise performance with reduced peak oxygen consumption (VO_2). To investigate the evolution of peak VO_2 after either surgery or percutaneous balloon valvotomy (PBV), 34 patients (10 males, 24 females) aged 54.6 ± 11 years (mean ± SD), with isolated mitral stenosis performed 3 consecutive cardiopulmonary exercise tests (bicycle, 10 watts/min, Medical Graphics analyzer), one just before and 2 after the treatment (at 103 ± 56.4 and at 430 ± 103 days). Mitral valve area was 1.03 ± 0.23 cm^2, mean transmitral gradient was 11.8 ± 4.79 mmHg and systolic pulmonary pressure was 52.3 ± 14.8 mmHg. Although, NYHA functional class was significantly improved (2.45 ± 0.56 vs 1.89 ± 0.49, p < 0.0001), exercise capacity did not change: peak VO_2:13.8 ± 4.18 vs 14.1 ± 4.8 vs 14.3 ± 4.9 ml/min/kg (NS), % of maximal predicted VO_2:57.8 ± 14.9 vs 59 ± 16.2 vs 63.6 ± 18.6% (NS). However, peak O_2 pulse (VO_2/heart rate) was improved: 5.9 ± 1.92 vs 7 ± 3 vs 6.4 ± 2 ml/min/beats (p < 0.02). Peak VO_2 increased after PBV (n = 9, from 13.5 ± 5 to 17.5 ± 4.7 ml/min/kg, p = 0.03) but not after surgery (n = 25, from 13.5 ± 3.7 to 12.9 ± 3.4 ml/min/kg). Mitral valve area and systolic pulmonary pressure were similar in the 2 groups but patients in the PBV group were younger (45.2 ± 10.8 vs 57.8 ± 9.16 years, p < 0.01). In conclusion, in patients with isolated mitral stenosis, despite a significant functional improvement, exercise performance is not improved at least one year after either surgery or PBV. Exercise intolerance in patients with mitral stenosis is mainly related to peripheral factors.

979-92 Importance of the Mitral Valve Echo Score on Cardiac Output Increase in Patients With Mitral Stenosis A Study Using Dobutamine Stress Echocardiography

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While the severity of mitral stenosis (MS) has been generally evaluated by the mitral valve area (MVA), the patients' ability to exercise may not necessarily depend on MVA. The purpose of our study is to assess the relation between the mitral valve echo score proposed by Wilkins and the dobutamine-induced increase in cardiac output (CO). We studied 24 patients with pure MS (3 male and 21 female, aged 56 ± 12 years). MVA was measured on a 2-D short-axis view. CO was calculated by continuous wave Doppler derived velocity-time integral and MVA. Dobutamine was infused incrementally up to 15 μg/min/kg (γ), and the data were compared at baseline and 15 γ of dobutamine.